

The Clipper Visits Battelle Lab

By KAREN CHANDLER-MIDDLETON

PART I

"The tour begins at 2 o'clock. Joan will meet you in the front hall, here in the administration building."

"Thank you, Marie." I glanced at the large wall clock in the receptionist's office: 1:45.

Outside, other tour guests mounted the wooden steps which led to the wide front porch. I overheard them commenting on the beauty of the grounds and the old New England colonial buildings.

"It's such an attractive place. Nicely landscaped, and these buildings blend in so well with the other houses along Washington Street. Battelle certainly has done a good job of maintaining these old buildings."

"Yes, they have. I think of that every time I drive by the Lab."

"You know, I've always wondered just what they really do here. I'm curious about their research."

"I once read an article about the Lab..."

Their conversation faded as I mounted the stairs to the second floor. I stopped in the doorway of Dr. Robert Hillman's office. The senior biologist was seated at his desk examining slides under his large photo microscope. Additional slides lay neatly stacked beside the instrument, beneath shelves lined with biological journals, reprints and texts. He heard me enter, looked up and motioned me over.

"I'm photographing slides of tissue sections taken from clams near Baffin Island in northern Canada. We're studying the effects of a controlled oil spill in a natural environment."

"How was the oil spill managed?"

He leaned back in his chair, paused for a moment, and reached for his pipe. "Three bays were selected for the study. One, left untouched, in the 'control'. The second is a site for the oil spill, and the third is a site for an oil spill with a dispersant added. We have sampled organisms from all three areas, concentrating on 2 molluscs, *Mya truncata* and *Macoma* sp. I will be studying the histopathology of the animals affected. Dr. Jerry Neff, our research biochemist, will study the biochemical and physiological effects."



Dr. Jerry Neff inspecting his experiment on oil dispersance.

As we spoke, Joan Sundstrom, a biologist at the lab and our tour guide, passed by the room. She paused, called to me, and held out a color brochure on Battelle from a pile she carried. I turned and followed her downstairs. Half a dozen people waited in the hall. Among them were 2 scientists living in Duxbury and a visiting chemist. A guest book lay open on the table. Having registered, members of the group were chatting or leafing through reprints, on display, of past research conducted by biologists at Battelle.

Once assembled, we left the administration building and headed across the driveway towards what Joan referred to as the 'Main Lab', a large white clapboard building opposite the administration building.

"And that building over there is the Richards' house," Joan explained, as we passed a large white colonial house fronting the street. "Bea and her husband worked many years with Dr. Clapp. The house is vacant now while we complete renovations."

"All the buildings are so attractive here," one woman said. "And the location is ideal. You must enjoy working here."

"Yes, it's a great place to work. The grounds are beautiful, and the atmosphere is casual and friendly. The lab we're headed towards is one of 8 buildings on our 10-acre estate. Like each of the other buildings, it has its own history. It was a barn originally. It is fitted now with offices and labs where much of our chemistry is done."

led into a narrow hallway. As we went upstairs to the second floor conference room, I studied the old photos of the lab which lined the walls. A large wooden plaque, riddled with shipworm holes, was hung above them, bearing raised metal lettering. Upstairs, in the vintage, paneled room, we met other guests assembled for the tour. They were examining large display cases, which stood in each corner of the room. Exhibits in the cases traced the history of the Lab from its modest beginnings on the Clapp Estate and in Dr. Clapp's old schooner moored in the Bay, to Battelle's acquisition of the facilities in 1964.

In addition to the displays, Joan had set up a slide show which highlighted much of the research at Battelle since that time. "Our lab is the focal point for Battelle's Marine Science research," she said. "Along with our continuing research in marine biodeterioration and fouling, we at Battelle have studied the impact of oil drilling on marine life. We monitor the coastal ecosystem, including our own Duxbury bay. Our research vessels, equipped with scuba divers and the latest sampling gear, provide us with marine organisms for studying vertebrate systems, systems ecology and benthic ecology.

"Using flow through and static bioassays, we test the toxicity of materials being released into our coastal ecosystem from ocean dumping and dredge spoils research mandated by the Marine Protection, Research and Sanctuaries Act. Industrial firms and utilities hire us to conduct environmental impact studies to determine effluent treatment, process design, and to meet disposal permit regulations.

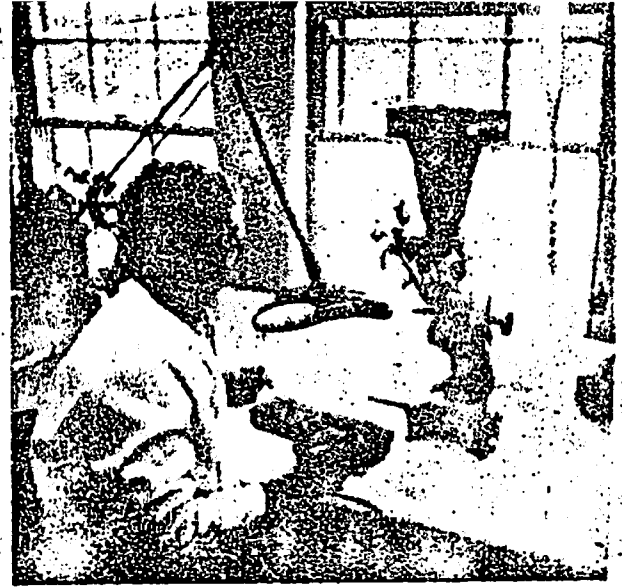
"Our histopathology studies determine the effect of the environment on tissues of marine organisms. We study, as well, pathology of fishes. Our most recent research in this area has been on fin erosion in flounder.

"We are also developing fast, inexpensive, analytic systems for pre-market screening of newly developed chemicals.

"Along with our research for private industry, we are currently heading 2 large projects for the National Science Foundation. One, led by Dr. Nancy Maciolek Blake, will categorize polychaetes for a new series of reference manuals. And we have other projects underway for the EPA. But, let me now take you to the individual labs so you can meet the staff and see our work in progress."

We left the Main Lab and headed down the hill towards a small white cottage. "This was the caretaker's cotage," Joan told us. "Now it contains

our shipworm lab. Irene Bellmore, a longtime associate at the Lab, heads the studies. She worked closely with Dr. Clapp before Battelle acquired the facilities."



Irene Bellmore

We entered the lab. Irene sat writing at her desk. She rose, smoothed her white lab smock, obviously pleased to see us.

"The research I do here on marine borers and fouling is the type of work on which the Lab was founded. We monitor degrees of deterioration and fouling for clients throughout the world. Untreated pine exposure panels are placed near client's piers and docks to measure short and long-term damage."

As she spoke, Irene held up a framework of rectangular panels. She handed it to one of the guests, and picked up two blocks of wood. They had been sliced in half, to reveal an interior riddled with hollow tubes.

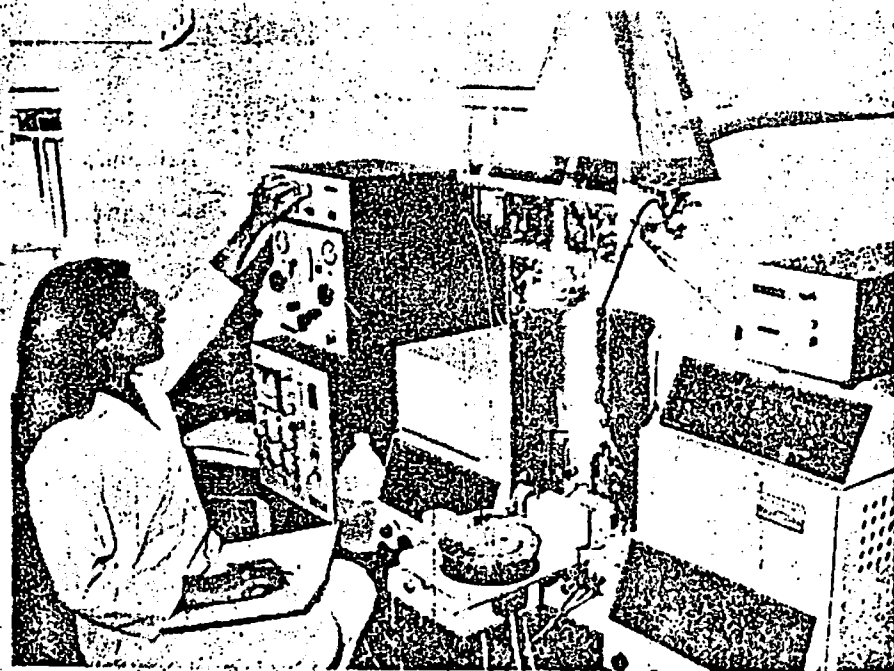
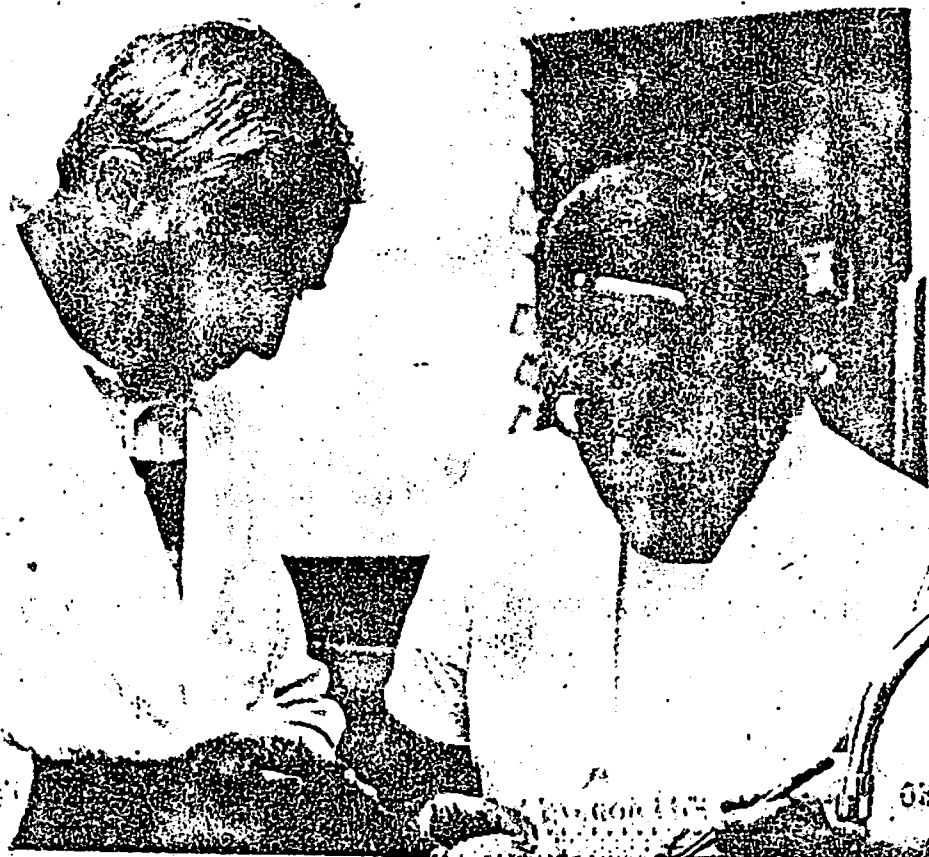
"Borer damage," she said. "We deal with 2 kinds of borers here. One is a mollusc, *Teredos*, or shipworm. Its damage is invisible from the outside. The animal lives in the wood, feeding on plankton. This second plank shows *Limnoria* damage. *Limnoria* is a crustacean, 1/8" long, which bores in from the outside. Here in these flasks," she continued, lifting a glass vial from a rectangular tray, "we raise shipworms for our research." I peered closely into the glass container and studied the white feathery siphons projecting from the piece of wood within.

"Disturb these creatures," she warned, shaking the vial, "and they immediately retract their siphons and seal the hole with platelets."

"How can you protect wood from shipworm attack?" a man asked.

"Pillings can be pressure treated with creosote or mineral salts. In another lab downstairs in the 'Shore House', we are testing such materials for resistance to *limnoria*. Sections of piling are inserted into tanks containing *limnoria*-infested wood. The animals migrate to the clean wooden surfaces and thus, we measure their effect against our coatings. Some pieces of wood have been in the tanks over 2 years now."

"Thank you Irene," Joan led us outside again. I took one last look at the borer panels, the vials of fresh *limnoria*, and at Irene, that small, energetic, gray-haired woman who had become an expert in a field of research made famous by her former colleague, Dr. Clapp. Her work spanned 2 eras at the Lab. She had seen the Lab grow and diversify in its research over the years. I asked her later how she felt about the changes that had taken place since Dr. Clapp's time. "Well, as I mentioned before, I left for a time and later returned. I am personally pleased to be able to carry on and add to our shipworm studies. In addition, we have such a fine staff of biologists here, and such wonderful facilities, that we are well qualified for a variety of research projects."



Left: Dr. Bob Hillman and Jounne Lahey examine tissues of diseased scallops.
And above: Holly Groelle working on determination of water pollutants.